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NEW RECORDS FOR PALEARCTIC *PHYTOCORIS* IN WESTERN NORTH AMERICA (HEMIPTERA: MIRIDAE)

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Abstract.—The Palearctic plant bugs *Phytocoris populi* (L.) and *P. varipes* Boheman are reported for the first time in North America, and new locality records are given for two Palearctic species previously recognized from North America. *Phytocoris populi* is reported from British Columbia, Canada, and from specimens collected in Whatcom County, Washington, on trunks and large branches of *Alnus rubra* Bong. *Phytocoris varipes* was taken at numerous localities in western Oregon on dried grasses and herbs. *Phytocoris dimidiatus* Kirschbaum, previously known in North America from a single specimen collected in Nova Scotia, Canada, is reported from Oregon and British Columbia; and *P. tiliae* (F.) is reported for the first time in Oregon. Illustrations of the adult and male genitalia of *P. populi* and *P. varipes* are provided.

Recent collections of Miridae in the Pacific Northwest were found to contain four Palearctic species of *Phytocoris.* Two of these species, *P. populi* (L.) and *P. varipes* Boheman, are new to North America. New locality records are given for *P. dimidiatus* Kirschbaum, previously known in North America only from Nova Scotia, Canada (Knight, 1923), and *P. tiliae* (F.) reported from British Columbia, Canada (Downes, 1924, 1957), New York (Wheeler and Henry, 1976), and Washington (Wheeler and Henry, 1976). Records of these four species are made available for inclusion in the forthcoming catalog of the Hemiptera-Heteroptera of America north of Mexico.

The following abbreviations are used for specimen depositories cited in the locality data: American Museum of Natural History (AMNH); Oregon State Department of Agriculture (OSDA); Oregon State University (OSU); University of British Columbia (UBC). All measurements are in mm.

Phytocoris populi (L.)

Figs. 1–5

Phytocoris populi is widely distributed in the British Isles, continental Europe, and northern Africa (Carvalho, 1959; Southwood and Leston, 1959; Wagner, 1971). It has been reported from a variety of deciduous trees including *Acer, Alnus, Fraxinus, Populus, Pyrus, Quercus, Salix, Tilia* and *Ulmus* (Butler, 1923; Wagner, 1971). Southwood and Leston (1959) noted that *P. populi* is a bark-inhabiting species and is often found resting in a flattened position on trunks of deciduous trees. The nymphs and adults of this species are predominantly pre-

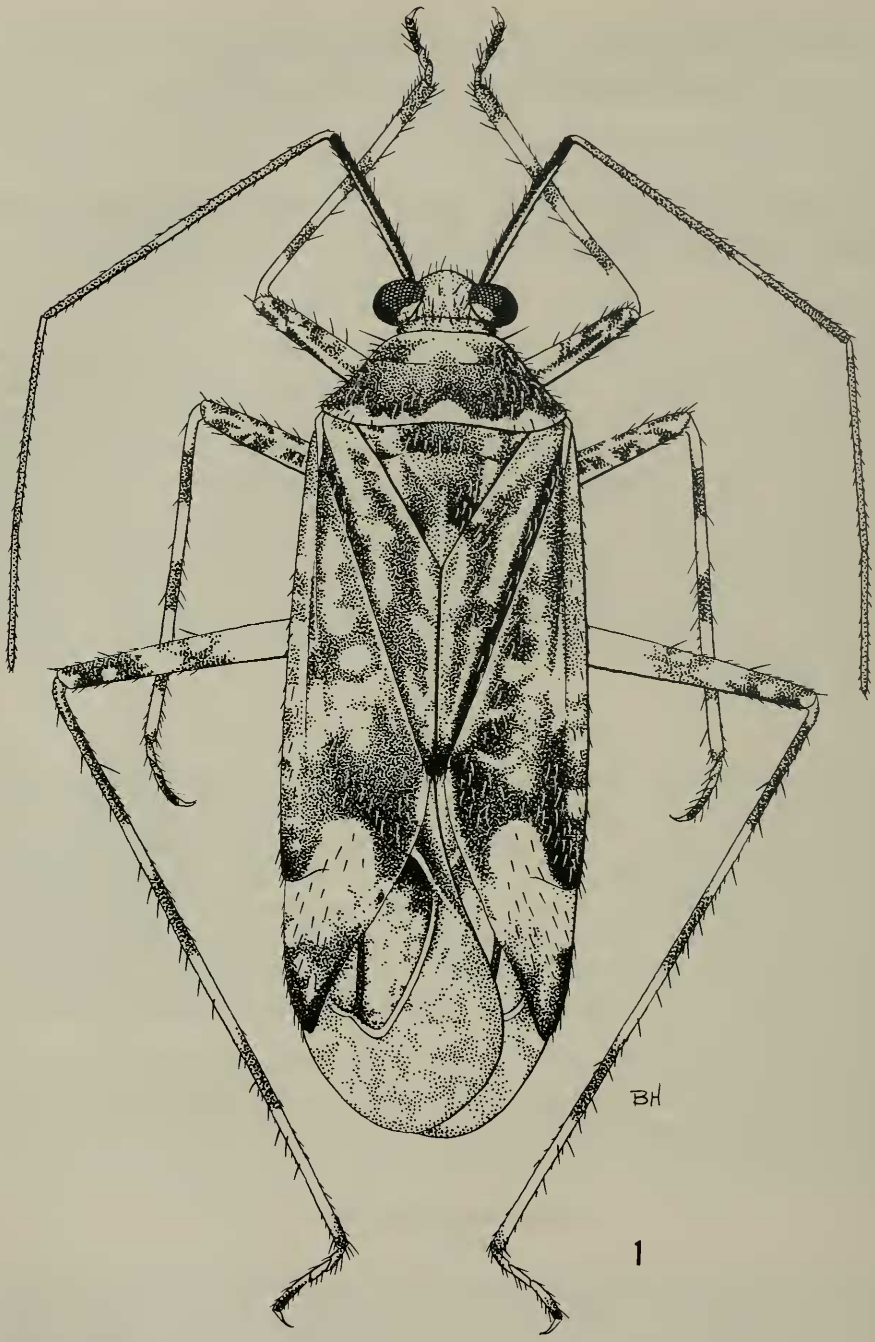


Fig. 1. *Phytocoris populi,* adult male.

daceous and feed on small insects such as Psocoptera and Psyllidae (Southwood and Leston, 1959). The eggs overwinter and hatch in late spring. Adults are found from June to November in England (Butler, 1923).

Saunders (1892) and Wagner (1971) described and illustrated the adult, and Wagner (1971) figured the male genitalia.

In mid-July 1981, nymphs (fourth and fifth instars) and adults of *P. populi* were collected in Bellingham, Whatcom County, Washington, on trunks and large branches of *Alnus rubra* Bong. Additional material was discovered in the collection of the University of British Columbia with label data: Vancouver, B.C., 10 August 1955, W. Downes.

Phytocoris populi is distinguished from other North American *Phytocoris* by the pale, longitudinal stripes on the first antennal segment; absence of tubercles above bases of claspers; and the long, serrulate sclerotized process of the vesica. In Knight (1968), this species keys somewhat poorly to *P. sonorensis* Van Duzee or the couplet containing *P. cercocarpi* Knight and *P. heidemanni* Reuter.

Adult male (Fig. 1).—Length 6.64–7.02, width 2.23–2.39. *Head:* Width across eyes 1.07–1.13, vertex 0.33–0.34; grayish yellow with fuscous markings; frons weakly convex, with 6–8 fuscous striae each side of midline. *Rostrum:* Length 2.75–2.83, extending to 4th or 5th abdominal segment. *Antenna:* Dark brown or black; I, length 1.26–1.46, with 2 or 3 longitudinal, pale stripes; II, length 2.30–2.66, usually with pale, median annulus; III, length 1.44–1.60; IV, length 1.01–1.08. *Pronotum:* mesal length 0.97–1.01, posterior width 1.80–1.87; dark brown, posterior margin narrowly pale; collar and inner angles of calli yellowish. *Scutellum:* Dark brown, anterolateral angles and apex pale. *Hemelytra:* Whitish to grayish yellow, extensively mottled with fuscous, sometimes almost entirely darkened; posteromedial region of corium pale; cuneus fuscous, pale at base; membrane conspurcate. *Venter:* Grayish yellow, genital segment and lateral margins of abdomen infuscated. *Legs:* Coxae grayish yellow; femora white to grayish yellow with fuscous markings; tibiae pale with 3 fuscous bands. *Vestiture:* Pronotal disk, scutellum, and hemelytra with black, simple setae intermixed with silvery, flattened setae. *Genitalia* (Figs. 2–5): Genital segment without tubercles above bases of claspers.

Female.—Similar to male in color and vestiture. Length 6.48–7.02, width 2.38–2.63. *Head:* Width across eyes 1.04–1.12, vertex 0.39–0.43. *Rostrum:* Length 2.95–3.04, extending to 4th or 5th abdominal segment. *Antenna:* I, 1.49–1.76; II, 2.61–2.79; III, 1.62–1.71; IV, 0.99–1.26. *Pronotum:* Mesal length 0.97–1.03, posterior width 1.82–1.96.

Phytocoris varipes Boheman

Figs. 6–10

Phytocoris varipes is a common species throughout the British Isles and continental Europe except the extreme northern regions (Butler, 1923; Southwood and Leston, 1959). Butler (1923) and Wagner (1971) also record this species from Algeria, Turkestan, and the Bol'shoy Kavkaz Mountains in southwestern USSR. *Phytocoris varipes* inhabits a variety of grasses and herbs in Europe and is reported to be principally phytophagous (Kullenberg, 1944; Southwood and Leston, 1959).

Food plants of this species include *Achillea, Anthemis, Bromus, Lathyrus, Phleum, Rumex,* and *Trifolium.* Southwood and Leston (1959) noted that feeding occurs mostly on flowers and unripe fruits. Eggs are deposited in the stems of the host plants and overwinter; adults are found from mid-June to October (Southwood and Leston, 1959; Wagner, 1971).

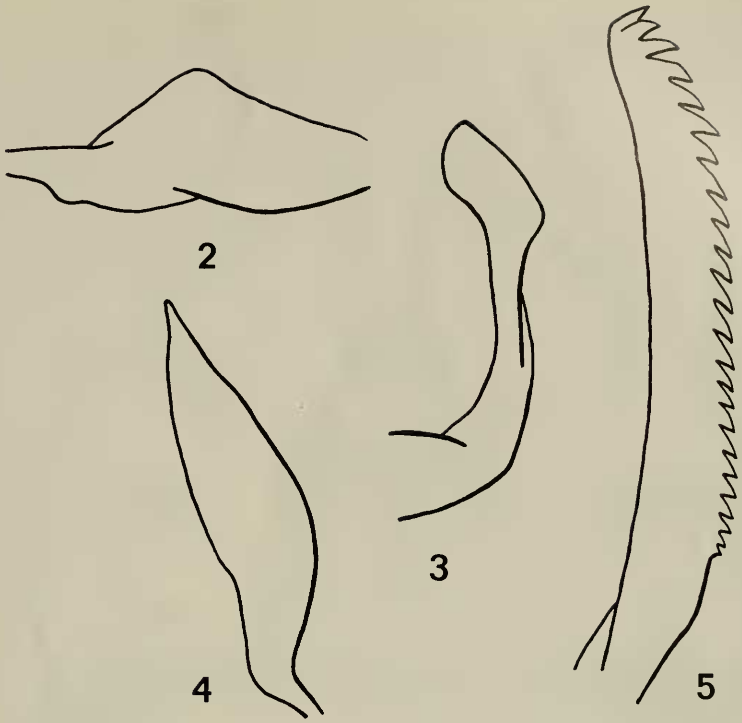
Kullenberg (1944) figured the fifth-instar nymph. The adult has been illustrated by Southwood and Leston (1959) and Wagner and Weber (1964). Illustrations of the male genitalia are provided by Wagner and Weber (1964) and Wagner (1971).

The following represent the first records for *P. varipes* in North America: OREGON. Benton Co.: Corvallis, many dates ranging from June 21 to Aug. 24 (OSU); Finley Wildlife Refuge, July 19, 1972 and Aug. 6, 1976 (Lattin; OSU); 3.5 mi NE Summit, Oct. 17, 1963 (Lattin; OSU); 9 mi NE Corvallis, Aug. 24, 1964 (OSU); 4 mi W Philomath, July 26, 1979 (Stonedahl; OSU); 15 mi SE Alsea, Aug. 12, 1977 (Lattin; OSU). Coos Co.: 2.5 mi W Remote, July 1, 1968 (Westcott; OSDA). Curry Co.: 3 mi S Port Orford, Aug. 11, 1979 (Stonedahl; OSU); 21 mi N Gold Beach, 30 meters, July 12, 1979 (J. Schuh, R. T. Schuh; AMNH). Douglas Co.: 3 mi N Sutherlin, July 19, 1975 (Russell; OSU); 35 mi W Winston, 190 meters, July 12, 1979 (Schuh; AMNH). Lane Co.: Green River, T15S, R9W, Sec. 8, Aug. 10, 1968 (Lattin; OSU); 3 mi N Coburg, July 20, 1956 (Lattin; OSU). Lincoln Co.: 10 mi N Hwy 34 on Grass Mtn Rd, 518 meters, Sept. 16, 1971 (Lattin; OSU); 10 mi ESE Waldport, Aug. 8–15, 1968 (Lattin; OSU); 2.5 mi N Waldport, Aug. 24, 1972 (Musgrave; OSU). Linn Co.: 8 mi E Lacomb, Aug. 17, 1968 (Lattin; OSU); Horse Butte, July 9, 1977 (Eulensen; OSU); Foster, Aug. 5, 1959 (Lattin; OSU). Marion Co.: 1 mi NW Sublimity, July 10, 1957 (Lattin; OSU); Woodburn, July 1, 1965 (Larson; OSDA). Polk Co.: 6 mi E Independence, July 10, 1957 (Lattin; OSU).

Much of the material from the preceding localities was collected at light. Both nymphs and adults were taken at several locations by sweeping herbaceous vegetation.

Phytocoris varipes keys to *P. piceicola* Knight in Knight (1968) but is distinguished from *piceicola* by the yellow and red general coloration, broad vertex, and distinct male genitalia. The combined occurrence of tubercles on the anterior and lateral margins of the male genital aperture will differentiate this species from all other North American *Phytocoris.* Externally, *P. varipes* resembles several native, grass and herb inhabiting species of *Phytocoris* (e.g., *P. fuscipennis* Knight, *P. roseipennis* Knight) but shows no relationship to these species with regard to male genital structures.

Adult male (Fig. 6).—Length 6.10–7.31, width 2.03–2.39. Width across eyes 1.01–1.10, vertex 0.47–0.51; pale yellow to testaceous; buccula, lorum, jugum, and clypeus marked with red; frons strongly convex, with reddish striae each side of midline. *Rostrum:* Length 3.40–3.67, extending to 7th or 8th abdominal segment. *Antenna:* Pale yellow to testaceous; I, length 1.22–1.52, tinged or spotted with red; II, length 2.70–3.14; III, length 2.01–2.28; IV, length 1.14–1.33. *Pronotum:* Mesal length 0.99–1.18, posterior width 1.62–1.94; yellow to pale grayish brown; basal submargin with a dark, sometimes indistinct, transverse band; collar with pair of medial reddish spots. *Scutellum:* Yellow to testaceous, pale median line bordered with red to fuscous. *Hemelytra:* Yellow to testaceous, often with reddish cast; claval vein pale, bordered by fuscous bands; posteromedial region



Figs. 2–5. *Phytocoris populi,* male genital structures. 2, Arm of left clasper, lateral view. 3, Shaft of left clasper, dorsal view. 4, Right clasper, lateral view. 5, Sclerotized process of vesica.

of corium with large, fuscous patch; cuneus marked with red; membrane conspurcate. *Venter:* Yellowish, mottled with reddish brown. *Legs:* Coxae yellow, lightly marked with red; femora yellow, mottled with red or reddish brown; tibiae pale yellow to testaceous; foretibia with 3 dark annuli, bands sometimes indistinct. *Vestiture:* Pronotal disk, scutellum, and hemelytra with dark, simple setae intermixed with golden and silvery, flattened setae. *Genitalia* (Figs. 7–10): Anterior margin of genital aperture with distinct tubercle in addition to tubercles above bases of claspers.

Female.—Similar to male in color and vestiture, hemelytra extending to or slightly beyond end of abdomen. Length 5.67–6.89, width 2.09–2.47. *Head:* Width across eyes 1.01–1.10, vertex 0.54–0.56. *Rostrum:* Length 3.52–3.82, extending to 7th abdominal segment. *Antenna:* I, 1.29–1.50; II, 2.60–3.17; III, 1.82–2.41; IV, 1.14–1.35. *Pronotum:* Mesal length 0.95–1.14, posterior width 1.48–1.84.

***Phytocoris tiliae* (F.)**

This species also is widely distributed in the British Isles, continental Europe, and northern Africa (Carvalho, 1959; Southwood and Leston, 1959). It inhabits the bark of many deciduous trees in Europe (Butler, 1923) and is reported to be largely predaceous on mites and small insects (Collyer, 1953; Southwood and Leston, 1959). Eggs overwinter and hatch from early June to early August; adults are present from late June until late October (Southwood and Leston, 1959).

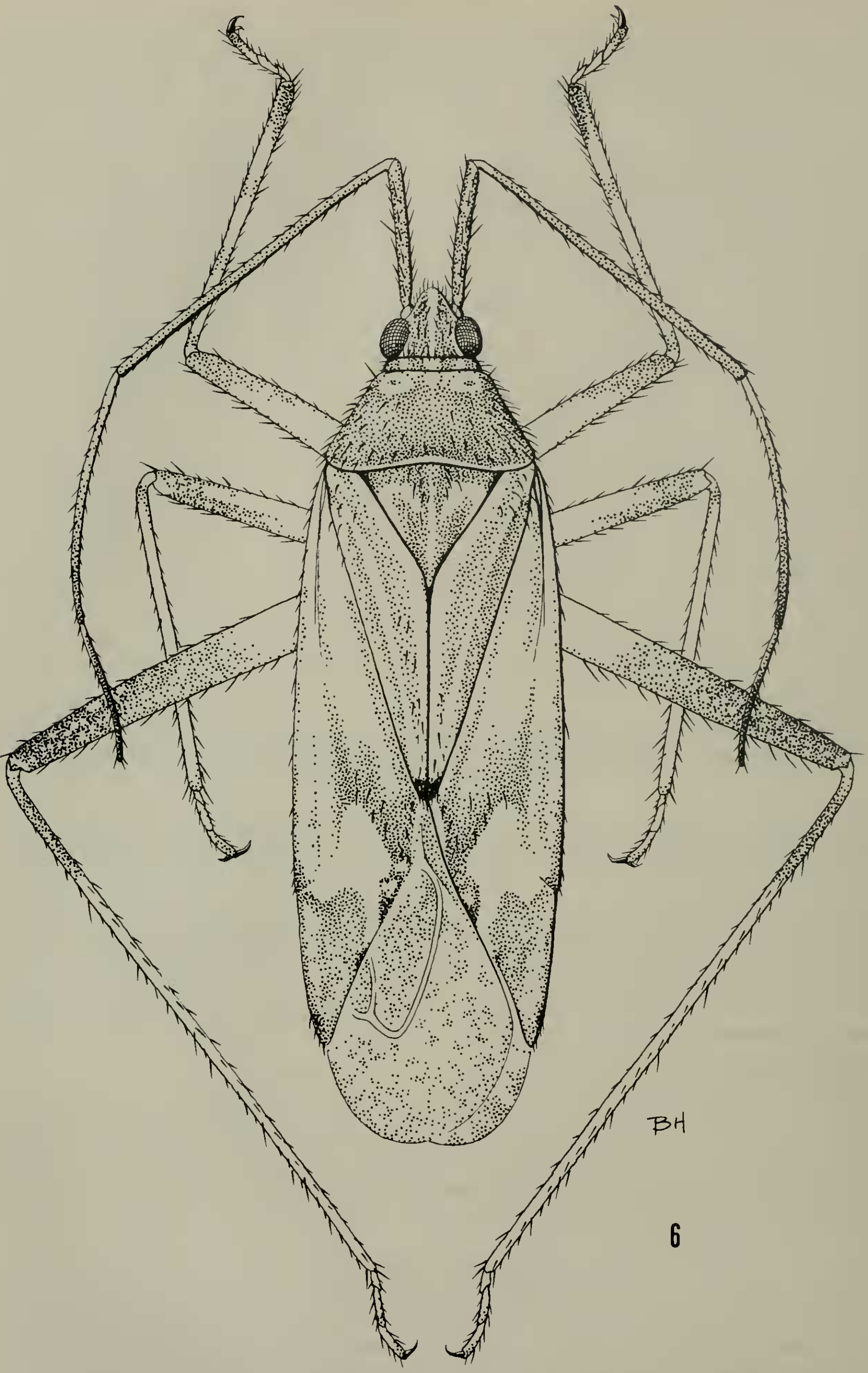


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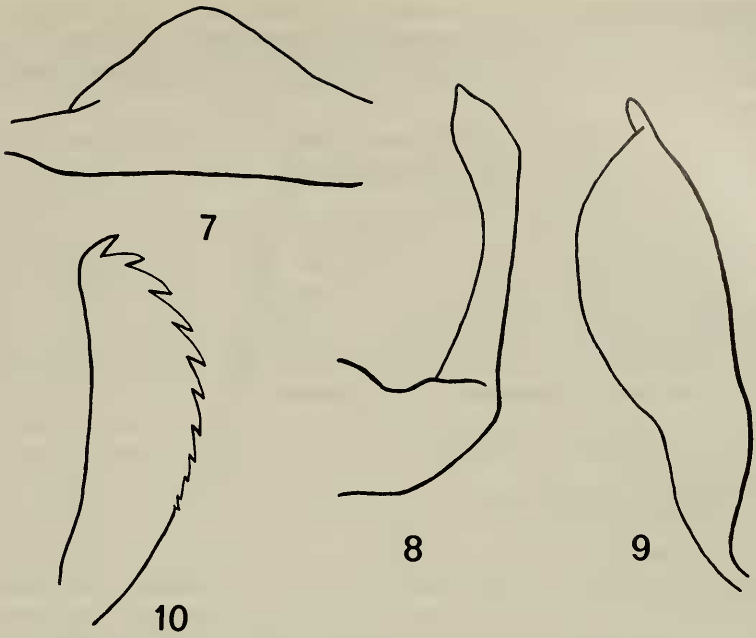
Fig. 6. *Phytocoris varipes*, adult male.



Figs. 7–10. *Phytocoris varipes,* male genital structures. 7, Arm of left clasper, lateral view. 8, Shaft of left clasper, dorsal view. 9, Right clasper, lateral view. 10, Sclerotized process of vesica.

The egg and fifth-instar nymph were described by Butler (1923). Saunders (1892), Southwood and Leston (1959), and Wagner (1971) illustrated the adult. Wagner (1971) also figured the male genitalia.

Phytocoris tiliae was first recorded in North America from Vancouver, British Columbia (Downes, 1924) and later reported from New York and Washington by Wheeler and Henry (1976). *Phytocoris tiliae* is now known from two localities in northwestern Oregon: Benton Co., Corvallis, Arnold Way, Aug. 20, 1981, ex. *Tilia platyphylla* Scop. (Stonedahl; OSU); Linn Co., Albany, 1450 Queen SW, Aug. 21, 1981, ex. *Salix* sp. and *Tilia platyphylla* (Stonedahl; OSU). Adults and nymphs were collected at both localities.

The description and diagnostic characters provided by Wheeler and Henry (1976) will serve to distinguish *P. tiliae* from other North American *Phytocoris.* This species keys with difficulty to *P. commissuralis* Van Duzee in Knight (1968) but differs by the smaller size, grayish white to greenish coloration, and pale pronotum with fuscous lateral margins. The male genital structures of *P. tiliae* are similar to those of *P. dimidiatus* and *P. populi.*

Phytocoris dimidiatus **Kirschbaum**

Phytocoris dimidiatus is distributed throughout the British Isles and much of continental Europe (Carvalho, 1959; Southwood and Leston, 1959). It also has been reported from Morocco (Lindberg, 1940), Siberia (Carvalho, 1959) and Nova Scotia, Canada (Knight, 1923). Like *P. populi* and *P. tiliae,* this species inhabits deciduous trees such as *Alnus, Fraxinus, Populus, Prunus, Pyrus, Quercus,* and

Salix. The feeding habits of *P. dimidiatus* are not well known, but Wagner (1971) reported that it is at least partially predaceous. The eggs overwinter and hatch in May or early June; adults are found from mid-June to November (Southwood and Leston, 1959).

Butler (1923) described the fifth-instar nymph and Southwood and Leston (1959) illustrated the adult. The male genitalia are figured by Knight (1923) and Wagner (1971).

The only previous record for *P. dimidiatus* in North America is a single male from Kentville, Nova Scotia, Aug. 27, 1917, W. H. Brittain (Knight, 1923). The following represent the first records for this species in western North America: BRITISH COLUMBIA. Lulu Is., Aug. 23, 1954 (Downes; UBC). OREGON. Benton Co.: Corvallis, July 30, 1959, taken at light (Lattin; OSU); Corvallis, Sept. 6, 1980, ex. *Pyrus* sp. (Stonedahl; OSU). Klamath Co.: Klamath Falls, Aug. 4, 1961, taken at light (Goeden; OSU). Multnomah Co.: Portland, July 9, 1940 (Schuh; OSU). Yamhill Co.: McMinnville, July 27, 1958, taken at light (Fender; OSU). WASHINGTON. Whatcom Co.: Bellingham, Aug. 23, 1980, taken on bark of *Pyrus* sp. (Stonedahl; OSU).

Phytocoris dimidiatus closely resembles *P. tiliae* but is distinguished by the darker brownish coloration, pale ventral surface of the first antennal segment, and uniformly brownish pronotum without fuscous lateral margins. Genital structures of the male are very similar to those of *P. tiliae.* The key and description provided by Knight (1923) will serve to separate *P. dimidiatus* from other *Phytocoris* species in eastern North America. In Knight (1968), this species keys to *P. sonorensis* Van Duzee but differs by the larger eyes, absence of tubercles on the lateral margins of the genital aperture, and the long, serrulate sclerotized process of the vesica.

DISCUSSION

Prior to the discovery of *P. populi* and *P. varipes* in the Pacific Northwest, three Palearctic species of *Phytocoris* (*P. dimidiatus, P. tiliae, P. ulmi* (L.)) had been reported from North America (Knight, 1923; Downes, 1924; Wheeler and Henry, 1976). The patchy coastal distributions of *P. dimidiatus* and *P. populi* suggest that these species are artificial introductions and not truly Holarctic. Like *P. tiliae,* these species appear to be recent invaders, possibly gaining entrance on nursery stock. Other Palearctic mirids are believed to have become established in this manner (Henry and Wheeler, 1979). Although more uniformly distributed than the above species, it is likely that *P. varipes* also was artificially introduced, possibly as eggs inserted in stems of non-native grass and/or herb species. A number of Palearctic Miridae have undergone rapid dispersion after being introduced into North America (e.g., *Adelphocoris lineolatus* (Goeze), *Megaloceroea recticornis* (Geoffroy)). These species have become widely distributed in a relatively short period of time and like *P. varipes,* occur in habitats composed largely of introduced grasses and herbs (Slater, 1974).

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